Author index

Abadía A. (*see* Morales F.), 1153.
Abadía J. (*see* Morales F.), 1153.
Aguirrezabal L.A.N., Deleens E. & Tardieu F. Root elongation rate is accounted for by intercepted PPFD and source-sink relations in field and laboratory-grown sunflower, 443.
Allen S.J., Brenner A.J. & Grace J. A low-cost psychrometer for field measurements of atmospheric humidity: technical report, 219.
Andrews J. (*see* Grange R.I.), 181.
Anekonda T.S., Criddle R.S., Libby W.J., Breidenbach R.W. & Hansen L.D. Respiration rates predict differences in growth of coast redwood, 197.
Anthony R.G. (*see* Jordan B.R.), 45.
ap Rees T. & Hill S.A. Metabolic control analysis of plant metabolism: commissioned review, 587.
Aparicio P.J., Witt F.G., Ramírez J.M., Quiñones M.A. & Balandín T. Blue-light-induced pH changes associated with NO_3^-, NO_2^- and Cl^- uptake by the green alga *Monoraphidium braunii*, 1323.
Arakawa K. (*see* Kishitani S.), 89.
Azaizeh H. (*see* Neumann P.M.), 303.

Baker N.R. (*see* Bredenkamp G.J.), 205.
Bal A.K. (*see* Barimah-Asare J.), 115.
Balachandran S. (*see* Preston C.), 1113.
Balandín T. (*see* Aparicio P.J.), 1323.
Barimah-Asare J. & Bal A.K. Symbiotic nitrogen-fixing root nodules of *Lathyrus maritimus* (L.) bigel (beach pea) from Newfoundland shore lines with special reference to oleosomes (lipid bodies), 115.
Bartels D. & Nelson D. Approaches to improve stress tolerance using molecular genetics: commissioned review, 659.
Bassuk N.L. (*see* Chandra S.), 867.
Bäck J., Neuvonen S. & Huttunen S. Pine needle growth and fine structure after prolonged acid rain treatment in the subarctic, 1009.
Beffagna N. & Romani G. Suitability of *Arabidopsis* for studies on intracellular pH regulation: correlation between H^+ pump activity, cytosolic pH and malate level in wild-type and in a mutant partially insensitive to fusicoccin, 681.
Belkhodja R. (*see* Morales F.), 1153.
Benfey P.N. & Schiefelbein J.W. Insights into root development from *Arabidopsis* root mutants: commissioned review, 675.
Benkert R. (*see* Zimmermann U.), 1169.
Bernier G. (*see* Périlleux C.), 755.
Berry J.A. (*see* Cardon Z.G.), 995.
Berry J.A. (*see* Yakir D.), 73.
Besford R.T. (*see* Van Oosten J.-J.), 913.
Bigot J. & Boucaud J. Low-temperature pretreatment of the root system of *Brassica rapa* L. plants: effects on the xylem sap exudation and on the nitrate absorption rate, 721.
Binzel M.L. (*see* Perez-Prat E.), 327.
Black C.C. (*see* Sung S.S.), 419.
Boari F. (*see* Malone M.), 81.
Bongi G., Palliotti A., Rocchi P., Moya I. & Goulas Y. Blue-green fluorescence excited by UV laser on leaves of different species originates from cutin and is sensitive to leaf temperature: short communication, 777.
Borst W.M. (*see* Downs C.G.), 1045.
Botella M.A. (*see* Perez-Prat E.), 327.
Boucaud J. (*see* Bigot J.), 721.
Böttger M. (*see* Döring O.), 451.
Bredenkamp G.J. & Baker N.R. Temperature-sensitivity of D1 protein metabolism in isolated *Zea mays* chloroplasts, 205.
Breidenbach R.W. (*see* Anekonda T.S.), 197.
Brenner A.J. (*see* Allen S.J.), 219.
Bressan R.A. (*see* Perez-Prat E.), 327.
Breviario D., Gianí S., Morello L. & Coraggio I. Anaerobiosis-mediated early transcriptional and translational responses in rice (*Oryza sativa* L.) coleoptiles and roots, 925.
Brown C.S. & Piastcuch W.C. Starch metabolism in germinating soybean cotyledons is sensitive to clinorotation and centrifugation: short communication, 341.
Browse J. (*see* Gibson S.), 627.
Brune A., Urbach W. & Dietz K.-J. Compartmentation and transport of zinc in barley primary leaves as basic mechanisms involved in zinc tolerance, 153.
Brune A. (*see* Speer M.), 1215.
Bugbee B. (*see* Smart D.R.), 435.

Caboche M. (*see* Hoff T.), 489.
Caldwell M.M., Flint S.D. & Searles P.S. Spectral balance and UV-B sensitivity of soybean: a field experiment, 267.
Cardon Z.G., Mott K.A. & Berry J.A. Dynamics of patchy stomatal movements, and their contribution to steady-state and oscillating stomatal conductance calculated using gas- exchange techniques, 995.
Carrié B., Gaspar Th., Greppin H. & Penel C. Redox characteristics of normal and habituated cell lines of sugarbeet, 457.
Casal J.J. & Sánchez R.A. Overexpression of oat phytochrome A gene differentially affects stem growth responses to red/far-red ratio signals characteristic of sparse or dense canopies, 409.
Chandra S., Lindsey P.A. & Bassuk N.L. A gauge to measure the mass flow rate of water in trees: technical report, 867.
Chatterton N.J. (*see* Smart D.R.), 435.
Chaves M.M. (*see* Krapp A.), 945.
Chinnappa C.C. (*see* Emery R.J.N.), 691.
Cochrane T.T. A new equation for calculating osmotic potential, 427.
Comins H.N. (*see* Kirschbaum M.U.F.), 1081.
Coraggio I. (*see* Breviario D.), 925.
Correia M.J. & Pereira J.S. Abscisic acid in apoplastic sap can account for the restriction in leaf conductance of white lupins during moderate soil drying and after rewatering, 845
Cosgrove D.J. (*see* Stahlberg R.), 1143.
Crawford J.W. (*see* Oparka K.J.), 163.
Criddle R.S., Hopkin M.S., McArthur E.D. & Hansen L.D. Plant distribution and the temperature coefficient of metabolism, 233.
Criddle R.S. (*see* Anekonda T.S.), 197.
Critchley C. (*see* Schnettger B.), 55.
Cui M. & Nobel P.S. Gas exchange and growth responses to elevated CO_2 and light levels in the CAM species *Opuntia ficus-indica*, 935.

Daudet F.-A. (*see* Vanderschmitt E.), 97.
David M.M. (*see* Krapp A.), 945.
Davis M.H. & Simmons S.R. Far-red light reflected from neighbouring vegetation promotes shoot elongation and accelerates flowering in spring barley plants, 829.
Deckmyn G., Martens C. & Impens I. The importance of the ratio UV-B/photosynthetic active radiation (PAR) during leaf development as determining factor of plant sensitivity to increased UV-B irradiance: effects on growth, gas exchange and pigmentation of bean plants (*Phaseolis vulgaris* cv. Label), 295.
Deleens E. (*see* Aguirrezabal L.A.N.), 443.

Delgado E., Mitchell R.A.C., Parry M.A.J., Driscoll S.P., Mitchell V.J. & Lawlor D.W. Interacting effects of CO_2 concentration, temperature and nitrogen supply on the photosynthesis and composition of winter wheat leaves, 1205.
Descourvières P. (*see* Foyer C.H.), 507.
Dietz K.-J. (*see* Brune A.), 153.
Downs C.G., Borst W.M., Hurst P.L. & Stevenson D.G. Isoforms of glutamine synthetase in asparagus spears: the cytosolic enzyme increases after harvest, 1045.
Döring O. & Böttger M. Temperature dependence of trans plasma membrane electron transport in *Zea mays* L. roots, 451.
Drake B.G. (*see* Thompson G.B.), 1161.
Driscoll S.P. (*see* Delgado E.), 1205.

Edwards W.R.N., Jarvis P.G., Grace J. & Moncrieff J.B. Reversing cavitation in tracheids of *Pinus sylvestris* L. under negative water potentials, 389.
Ekblad A., Lundquist P.-O., Sjöström M. & Huss-Danell K. Day-to-day variation in nitrogenase activity of *Alnus incana* explained by weather variables: a multivariate time series analysis, 319.
Ellis R.H. (*see* Wheeler T.R.), 1275.
Emery R.J.N., Reid D.M. & Chinnappa C.C. Phenotypic plasticity of stem elongation in two ecotypes of *Stellaria longipes*: the role of ethylene and response to wind, 691.
Emons A.M.C. Winding threads around plant cells: a geometrical model for microfibril deposition: opinion, 3.
Estelle M. (*see* Hobbie L.), 525.

Fahnestock J.T. (*see* Knapp A.K.), 189.
Falcone D.L. (*see* Gibson S.), 627.
Ferullo J.-M., Nespoulous L. & Triantaphylidès C. Gamma-ray-induced changes in the synthesis of tomato pericarp protein, 901.
Field C.B. (*see* Luo Y.), 1195.
Flint S.D. (*see* Caldwell M.M.), 267.
Forde B.G. (*see* Lea P.J.), 541.
Foyer C.H., Descourvières P. & Kunert K.J. Protection against oxygen radicals: an important defence mechanism studied in transgenic plants: commissioned review, 507.
Freund M. (*see* Heilmeier H.), 1125.
Freund M. (*see* Monson R.K.), 1133.
Frommer W. (*see* Sonnewald U.), 649.
Frye R. (*see* Glenn E.P.), 711.
Fujii S. Effect of Ca^{2+} on the retention of glycerol and amino acids in *Dunaliella tertiolecta*: short communication, 227.
Furtula V. (*see* Koster K.L.), 1285.

Garcia R.L., Idso S.B., Wall G.W. & Kimball B.A. Changes in net photosynthesis and growth of *Pinus eldarica* seedlings in response to atmospheric CO_2 enrichment, 971.
Garnier E. & Vancaeyzeele S. Carbon and nitrogen content of congeneric annual and perennial grass species: relationships with growth, 399.
Gaspar Th. (*see* Carrié B.), 457.
Gebauer R.L.E. (*see* Sims D.A.), 889.
Geiger D.R. (*see* Sung S.S.), 419.
Gianí S. (*see* Breviario D.), 925.
Gibson S., Falcone D.L., Browse J. & Somerville C. Use of transgenic plants and mutants to study the regulation and function of lipid composition: commissioned review, 627.
Giles L. (*see* Yakir D.), 73.
Giovannoni J.J. (*see* Gray J.E.), 557.
Glenn E.P., Olsen M., Frye R., Moore D. & Miyamoto S. How much sodium accumulation is necessary for salt tolerance in subspecies of the halophyte *Atriplex canescens*?, 711.
Goldstein G. (*see* Lipp C.C.), 1035.
Goldstein G. (*see* Zimmermann U.), 1169.
Goulas Y. (*see* Bongi G.), 777.
Grace J. (*see* Allen S.J.), 219.
Grace J. (*see* Edwards W.R.N.), 389.
Graf M. (*see* Schnettger B.), 55.
Grange R.I. & Andrews J. Expansion rate of young tomato fruit growing on plants at positive water potential, 181.
Grantz D.A. (*see* Gutiérrez M.V.), 1305.
Gray J.E., Picton S., Giovannoni J.J. & Grierson D. The use of transgenic and naturally occurring mutants to understand and manipulate tomato fruit ripening: commissioned review, 557.
Greenspan M.D., Shackel K.A. & Matthews M.A. Developmental changes in the diurnal water budget of the grape berry exposed to water deficits, 811.
Greppin H. (*see* Carrié B.), 457.
Grierson D. (*see* Gray J.E.), 557.
Griffiths H. (*see* Robe W.E.), 1073.
Gutiérrez M.V., Meinzer F.C. & Grantz D.A. Regulation of transpiration in coffee hedgerows: covariation of environmental variables and apparent responses of stomata to wind and humidity, 1305.

Haase A. (*see* Zimmermann U.), 1169.
Habib R. (*see* Simonneau T.), 379.
Hadley P. (*see* Wheeler T.R.), 1275.
Hangarter R.P. (*see* Liscum E.), 639.
Hansen L.D. (*see* Anekonda T.S.), 197.
Hansen L.D. (*see* Criddle R.S.), 233.
Hansted L., Jakobsen H.B. & Olsen C.E. Influence of temperature on the rhythmic emission of volatiles from *Ribes nigrum* flowers *in situ*, 1069.
Harberd N.P. (*see* Whitelam G.C.), 615.
Hasegawa P.M. (*see* Perez-Prat E.), 327.
He J., Huang L.-K. & Whitecross M.I. Chloroplast ultrastructure changes in *Pisum sativum* associated with supplementary ultraviolet (UV-B) radiation: short communication, 771.
Heilmeier H., Freund M., Steinlein T., Schulze E.-D. & Monson R.K. The influence of nitrogen availability on carbon and nitrogen storage in the biennial *Cirsium vulgare* (Savi) Ten. I. Storage capacity in relation to resource acquisition, allocation and recycling, 1125.
Heilmeier H. (*see* Monson R.K.), 1133.
Heilmeier H. (*see* Schulze W.), 795.
Hill S.A. (*see* ap Rees T.), 587.
Hobbie L. & Estelle M. Genetic approaches to auxin action: commissioned review, 525.
Hoff T., Truong H.-N. & Caboche M. The use of mutants and transgenic plants to study nitrate assimilation: commissioned review, 489.
Hopkin M.S. (*see* Criddle R.S.), 233.
Huang L.-K. (*see* He J.), 771.
Hunt H.W. (*see* Morgan J.A.), 1023.
Hurst P.L. (*see* Downs C.G.), 1045.
Huss-Danell K. (*see* Ekblad A.), 319.
Huttunen S. (*see* Bäck J.), 1009.

Idso S.B. (*see* Garcia R.L.), 971.
Impens I. (*see* Deckmyn G.), 295.
Izui K. (*see* Toh H.), 31.

Jakobsen H.B. (*see* Hansted L.), 1069.
James P.E. (*see* Jordan B.R.), 45.
Jarvis P.G. (*see* Edwards W.R.N.), 389.
Jeschke W.D. (*see* Pate J.S.), 1263.
Ji Y.-M. (*see* Pearson J.), 1331.
Jones H.G. (*see* Malone M.), 81.

Jordan B.R., James P.E., Strid Å & Anthony R.G. The effect of ultraviolet-B radiation and gene expression and pigment composition in etoilated and green pea leaf tissue: UV-B- induced changes are gene-specific and dependent upon the developmental stage, 45.

Kaiser W.M. (*see* Speer M.), 1215.
Kaiser W.M. (*see* Speer M.), 1223.
Kamula S.A., Peterson C.A. & Mayfield C.I. The plasmalemma surface area exposed to the soil solution is markedly reduced by maturation of the exodermis and death of the epidermis in onion roots, 1183.
Kangasjärvi J., Talvinen J., Utriainen M. & Karjalainen R. Plant defence systems induced by ozone: commissioned review, 783.
Kano H. (*see* Takahashi K.), 105.
Karjalainen R. (*see* Kangasjärvi J.), 783.
Kawamura T. (*see* Toh H.), 31.
Keith H. (*see* Kirschbaum M.U.F.), 1081.
Khanna P.K. (*see* Kirschbaum M.U.F.), 1081.
Kimball B.A. (*see* Garcia R.L.), 971.
Kinet J.-M. (*see* Périlleux C.), 755.
King D.A. (*see* Kirschbaum M.U.F.), 1081.
Kirschbaum M.U.F., King D.A., Comins H.N., McMurtrie R.E., Medlyn B.E., Pongracic S., Murty D., Keith H., Raison R.J., Khanna P.K. & Sheriff D.W. Modelling forest response to increasing CO_2 concentration under nutrient-limited conditions: theoretical paper, 1081.
Kirschbaum M.U.F. The sensitivity of C_3 photosynthesis to increasing CO_2 concentration: a theoretical analysis of its dependence on temperature and background CO_2 concentration, 747.
Kishitani S., Watanabe K., Yasuda S., Arakawa K. & Takabe T. Accumulation of glycinebetaine during cold acclimation and freezing tolerance in leaves of winter and spring barley plants, 89.
Kiss J.Z. Negative phototropism in young gametophytes of the fern *Schizaea pusilla*, 1339.
Klomparens K.L. (*see* Schuette J.L.), 355.
Klug M.J. (*see* Schuette J.L.), 355.
Knapp A.K., Fahnestock J.T. & Owensby C.E. Elevated atmospheric CO_2 alters stomatal responses to variable sunlight in a C_4 grass, 189.
Knight C.D. Studying plant development in mosses: the transgenic route: commissioned review, 669.
Knight J.D., Livingston N.J. & Van Kessel C. Carbon isotope discrimination and water-use efficiency of six crops grown under wet and dryland conditions, 173.
Kohl D.H., Straub P.F. & Shearer G. Does proline play a special role in bacteroid metabolism?: opinion, 1257.
Koide R.T. (*see* Shumway D.L.), 821.
Koizumi M. (*see* Takahashi K.), 105.
Koster K.L., Tengbe M.A., Furtula V. & Nothnagel E.A. Effects of low temperature on lateral diffusion in plasma membranes on maize (*Zea mays* L.) root cortex protoplasts: relevance to chilling sensitivity, 1285.
Koßmann J. (*see* Müller-Röber B.), 601.
Kramer K. A modelling analysis of the effects of climatic warming on the probability of spring frost damage to tree species in The Netherlands and Germany, 367.
Krapp A., Chaves M.M., David M.M., Rodriques M.L., Pereira J.S. & Stitt M. Decreased ribulose-1,5-bisphosphate carboxylase/oxygenase in transgenic tobacco transformed with 'antisense' *rbc*S. VIII. Impact on photosynthesis and growth in tobacco growing under extreme high irradiance and high temperature, 945.
Krapp A. & Stitt M. Influence of high carbohydrate content on the activity of plastidic and cytosolic isoenzyme pairs in photosynthetic tissues, 861.
Krause G.H. (*see* Schnettger B.), 55.
Kuchenbrod E. (*see* Zimmermann U.), 1169.
Kunert K.J. (*see* Foyer C.H.), 507.

Lawlor D.W. (*see* Delgado E.), 1205.
Lea P.J. & Forde B.G. The use of mutants and transgenic plants to study amino acid metabolism: commissioned review, 541.
Leblanc R.M. (*see* N'Soukpoé-Kossi C.N.), 731.
Lecain D.R. (*see* Morgan J.A.), 1023.
Leon D. (*see* Neumann P.M.), 303.
Lerchl J. (*see* Sonnewald U.), 649.
Lernmark U. (*see* Palmqvist K.), 65.
Leverenz J.W. (*see* Olsson T.), 701.
Libby W.J. (*see* Anekonda T.S.), 197.
Lilley R. McC. (*see* Shariati M.), 1295.
Lindsey P.A. (*see* Chandra S.), 867.
Lipp C.C., Goldstein G., Meinzer F.C. & Niemczura W. Freezing tolerance and avoidance in high-elevation Hawaiian plants, 1035.
Liscum E. & Hangarter R.P. Mutational analysis of blue-light sensing in *Arabidopsis*: commissioned review, 639.
Livingston N.J. A feedback control system for the precise and continuous regulation of photosynthetic flux density: technical report, 111.
Livingston N.J. (*see* Knight J.D.), 173.
Lucas W.J. (*see* Wolf S.), 573.
Lundquist P.-O. (*see* Ekblad A.), 319.
Luo Y., Field C.B. & Mooney H.A. Predicting responses of photosynthesis and root fraction to elevated $[CO_2]_a$: interactions among carbon, nitrogen, and growth: theoretical paper, 1195.
Lüttge U. (*see* Ratajczak R.), 1101.

McArthur E.D. (*see* Criddle R.S.), 233.
McKee I.F. & Woodward F.I. The effect of growth at elevated CO_2 concentrations on photosynthesis in wheat, 853.
McMurtrie R.E. (*see* Kirschbaum M.U.F.), 1081.
McNaughton K.G. Effective stomatal and boundary-layer resistances of heterogeneous surfaces, 1061.
Madsen T.V. & Sand-Jensen K. The interactive effects of light and inorganic carbon on aquatic plant growth, 955.
Malloch A.J.C. (*see* Perera L.K.R.R.), 335.
Malone M., Palumbo L., Boari F., Monteleone M. & Jones H.G. The relationship between wound-induced proteinase inhibitors and hydraulic signals in tomato seedlings, 81.
Mansfield T.A. (*see* Perera L.K.R.R.), 335.
Marañón T. (*see* Romero J.M.), 1243.
Marañón T. (*see* Romero J.M.), 1249.
Martens C. (*see* Deckmyn G.), 295.
Matthews M.A. (*see* Greenspan M.D.), 811.
Mayfield C.I. (*see* Kamula S.A.), 1183.
Medlyn B.E. (*see* Kirschbaum M.U.F.), 1081.
Meharg A.A. Integrated tolerance mechanisms: constitutive and adaptive plant responses to elevated metal concentrations in the environment: opinion, 989.
Meinzer F.C. (*see* Gutiérrez M.V.), 1305.
Meinzer F.C. (*see* Lipp C.C.), 1035.
Meinzer F.C. (*see* Zimmermann U.), 1169.
Mineuchi K. (*see* Takahashi K.), 105.
Mitchell R.A.C. (*see* Delgado E.), 1205.
Mitchell V.J. (*see* Delgado E.), 1205.
Miyamoto S. (*see* Glenn E.P.), 711.
Moncrieff J.B. (*see* Edwards W.R.N.), 389.
Monson R.K., Schulze E.-D., Freund M. & Heilmeier H. The influence of nitrogen availability on carbon and nitrogen storage in

the biennial *Cirsium vulgare* (Savi) Ten. II. The cost of nitrogen storage, 1133.
Monson R.K. (*see* Heilmeier H.), 1125.
Monteleone M. (*see* Malone M.), 81.
Monz C.A. (*see* Morgan J.A.), 1023.
Mooney H.A. (*see* Luo Y.), 1195.
Mooney H.A. (*see* Schulze W.), 795.
Moore D. (*see* Glenn E.P.), 711.
Morales F., Abadía A., Belkhodja R. & Abadía J. Iron deficiency-induced changes in the photosynthetic pigment composition of field-grown pear (*Pyrus communis* L.) leaves, 1153.
Morello L. (*see* Breviario D.), 925.
Morgan J.A., Hunt H.W., Monz C.A. & Lecain D.R. Consequences of growth at two carbon dioxide concentrations and two temperatures for leaf gas exchange in *Pascopyrum smithii* (C_3) and *Bouteloua gracilis* (C_4), 1023.
Morison J.I.L. (*see* Wheeler T.R.), 1275.
Mott K.A. (*see* Cardon Z.G.), 995.
Moya I. (*see* Bongi G.), 777.
Murillo J.M. (*see* Romero J.M.), 1249.
Murphy R. & Smith J.A.C. A critical comparison of the pressure-probe and pressure-chamber techniques for estimating leaf-cell turgor pressure in *Kalanchoë daigremontiana*, 15.
Murty D. (*see* Kirschbaum M.U.F.), 1081.
Musil C.F. & Wand S.J.E. Differential stimulation of an arid- environment winter ephemeral *Dimorphia pluvialis*, 245.
Müller-Röber B. & Koßmann J. Approaches to influence starch quantity and starch quality in transgenic plants: commissioned review, 601.

Nakamura T. (*see* Takahashi K.), 105.
Narasimhan M.L. (*see* Perez-Prat E.), 327.
Nelson D. (*see* Bartels D.), 659.
Nespoulous L. (*see* Ferullo J.-M.), 901.
Neumann P.M., Azaizeh H. & Leon D. Hardening of root cell walls: a growth inhibitory response to salinity stress, 303.
Neuvonen S. (*see* Bäck J.), 1009.
Newman J.R. (*see* Raven J.A.), 123.
Niemczura W. (*see* Lipp C.C.), 1035.
Niu X. (*see* Perez-Prat E.), 327.
Nobel P.S. (*see* Cui M.), 935.
Nothnagel E.A. (*see* Koster K.L.), 1285.
N'Soukpoé-Kossi C.N., Veeranjaneyulu K. & Leblanc R.M. Sites of action of sulphite and bisulphite in the photosynthetic apparatus of sugar maple leaves as studied by photo-acoustic and modulated fluorescence methods, 731.

Offler C.E. (*see* Wang H.L.), 257.
Ögren E. (*see* Palmqvist K.), 65.
Okamoto A. (*see* Okamoto H.), 979.
Okamoto H. & Okamoto A. The pH-dependent yield threshold of the cell wall in a glycerinated hollow cylinder (*in vitro* system) of cowpea hypocotyl, 979.
Oleksyn J. (*see* Tjoelker M.G.), 211.
Olsen C.E. (*see* Hansted L.), 1069.
Olsen M. (*see* Glenn E.P.), 711.
Olsson T. & Leverenz J.W. Non-uniform stomatal closure and the apparent convexity of the photosynthetic photon flux density response curve, 701.
Oparka K.J., Prior D.A.M. & Crawford J.W. Behaviour of plasma membrane, cortical ER and plasmodesmata during plasmolysis of onion epidermal cells, 163.
Osborne B.A. Photon requirement for O_2-evolution in red (=680 nm) light for some C_3 and C_4 plants and a C_3-C_4 intermediate species, 143.
Osmond C.B. (*see* Yakir D.), 73.
Ougham H.J. (*see* Schünmann P.H.D.), 1315.
Owensby C.E. (*see* Knapp A.K.), 189.

Palliotti A. (*see* Bongi G.), 777.
Palmqvist K., Ögren E. & Lernmark U. The CO_2-concentrating mechanism is absent in the green alga *Coccomyxa*: a comparative study of photosynthetic CO_2 and light responses of *Coccomyxa, Chalmydomonas reinhardtii* and barley protoplasts, 65.
Palumbo L. (*see* Malone M.), 81.
Parry M.A.J. (*see* Delgado E.), 1205.
Pate J.S., Woodall G., Jeschke W.D. & Stewart G.R. Root xylem transport of amino acids in the root hemiparasitic shrub *Olax phyllanthi* (Labill) R.Br. (Olacaceaea) and its multiple hosts, 1263.
Patrick J.W. (*see* Wang H.L.), 257.
Pearcy R.W. (*see* Sims D.A.), 881.
Pearcy R.W. (*see* Sims D.A.), 889.
Pearson J. & Ji Y.-M. Seasonal variation of leaf glutamine synthetase isoforms in temperate deciduous trees strongly suggests different functions for the enzymes, 1331.
Peeters K.M.U. & Van Laere A.J. Amino acid metabolism associated with N-mobilization from the flag leaf of wheat (*Triticum aestivum* L.) during grain development, 131.
Penel C. (*see* Carrié B.), 457.
Pereira J.S. (*see* Correia M.J.), 845.
Pereira J.S. (*see* Krapp A.), 945.
Perera L.K.R.R., Mansfield T.A. & Malloch A.J.C. Stomatal responses to sodium ions in *Aster tripolium*: a new hypothesis to explain salinity regulation in above-ground tissues, 335.
Perez-Prat E., Narasimhan M.L., Niu X., Botella M.A., Bressan R.A., Valpuesta V., Hasegawa P.M. & Binzel M.L. Growth cycle stage-dependent NaCl induction of plasma membrane H^+-ATPase mRNA accumulation in de-adapted tobacco cells, 327.
Peterson C.A. (*see* Kamula S.A.), 1183.
Périlleux C., Bernier G. & Kinet J.-M. Circadian rhythms and the induction of flowering in the long-day grass *Lolium temulentum* L., 755.
Piastcuch W.C. (*see* Brown C.S.), 341.
Picton S. (*see* Gray J.E.), 557.
Plaxton W.C. (*see* Theodorou M.E.), 287.
Pongracic S. (*see* Kirschbaum M.U.F.), 1081.
Poorter H. (*see* van Arendonk), 963.
Powles S.B. (*see* Preston C.), 1113.
Preston C., Balachandran S. & Powles S.B. Investigations of mechanisms of resistance to bipyridyl herbicides in *Arctotheca calendula* (L.) Levyns, 1113.
Prior D.A.M. (*see* Oparka K.J.), 163.
Purcell L.C. & Sinclair T.R. An osmotic hypothesis for the regulation of oxygen permeability in soybean nodules, 837.

Quarmby C. (*see* Robe W.E.), 1073.
Quiñones M.A. (*see* Aparicio P.J.), 1323.

Raghavendra A.S. (*see* Saradadevi K.), 739.
Raison R.J. (*see* Kirschbaum M.U.F.), 1081.
Ramírez J.M. (*see* Aparicio P.J.), 1323.
Ratajczak R., Richter J. & Lüttge U. Adaptation of the tonoplast V-type H^+-ATPase of *Mesembryanthemum crystallinum* to salt stress, C_3-CAM transition and plant age, 1101.
Raven J.A. & Newman J.R. Requirement for carbonic anhydrase activity in processes other than photosynthetic inorganic carbon assimilation: opinion, 123.
Reich P.B. (*see* Tjoelker M.G.), 211.
Reid D.M. (*see* Emery R.J.N.), 691.
Richter J. (*see* Ratajczak R.), 1101.
Robe W.E., Griffiths H., Sleep D. & Quarmby C. Nitrogen parti-

tioning and assimilation: methods for the extraction, separation and mass spectrometric analysis of nitrate, amino acid and soluble protein pools from individual plants following ^{15}N labelling: technical report, 1073.

Robinson J.M. Speculations on carbon dioxide starvation, Late Tertiary evolution of stomatal regulation and floristic modernization: opinion, 345.

Rocchi P. (*see* Bongi G.), 777.

Rodriques M.L. (*see* Krapp A.), 945.

Romani G. (*see* Beffagna N.), 681.

Romero J.M., Marañón T. & Murillo J.M. Long-term responses of *Melilotus segetalis* to salinity. II. Nutrient absorption and utilization, 1249.

Romero J.M. & Marañón T. Long-term responses of *Melilotus segetalis* to salinity. I. Growth and partitioning, 1243.

Saliendra NZ (*see* Sperry J.S.), 1233.

Sand-Jensen K. (*see* Madsen T.V.), 955.

Santore U.J. (*see* Schnettger B.), 55.

Saradadevi K. & Raghavendra A.S. Inhibition of photosynthesis by osmotic stress in pea (*Pisum sativum*) mesophyll protoplasts is intensified by chilling or photoinhibitory light; intriguing responses of respiration, 739.

Sánchez R.A. (*see* Casal J.J.), 409.

Schiefelbein J.W. (*see* Benfey P.N.), 675.

Schneider H. (*see* Zimmermann U.), 1169.

Schnettger B., Critchley C., Santore U.J., Graf M. & Krause G.H. Relationship between photoinhibition of photosynthesis, D1 protein turnover and chloroplast structure: effects of protein synthesis inhibitors, 55.

Schuette J.L., Klug M.J. & Klomparens K.L. Influence of stem lacunar structure on gas transport: relation to the oxygen transport potential of submersed vascular plants, 355.

Schulze D. (*see* Stitt M.), 465.

Schulze E.-D. (*see* Heilmeier H.), 1125.

Schulze E.-D. (*see* Monson R.K.), 1133.

Schulze E.-D. (*see* Schulze W.), 795.

Schulze W., Schulze E.-D., Stadler J., Heilmeier H., Stitt M. & Mooney H.A. Growth and reproduction of *Arabidopsis thaliana* in relation to storage of starch and nitrate in the wild-type and in starch-deficient and nitrate-uptake-deficient mutants, 795.

Schünmann P.H.D., Ougham H.J. & Turk K.S. Leaf extension in the *slender* barley mutant: delineation of the zone of cell expansion and changes in translatable mRNA during leaf development, 1315.

Searles P.S. (*see* Caldwell M.M.), 267.

Shackel K.A. (*see* Greenspan M.D.), 811.

Shariati M. & Lilley R. McC. Loss of intracellular glycerol from *Dunaliella* by electroporation at constant osmotic pressure: subsequent restoration of glycerol content and associated volume changes, 1295.

Shearer G. (*see* Kohl D.H.), 1257.

Sheih W.J. (*see* Sung S.S.), 419.

Sheriff D.W. (*see* Kirschbaum M.U.F.), 1081.

Shumway D.L. & Koide R.T. Within-season variability in mycorrhizal benefit to reproduction in *Abutilon theophrasti* Medic., 821.

Simmons S.R. (*see* Davis M.H.), 829.

Simonneau T. & Habib R. Water uptake regulation in peach trees with split-root systems, 379.

Sims D.A., Gebauer R.L.E. & Pearcy R.W. Scaling sun and shade photosynthetic acclimation of *Alocasia macrorrhiza* to whole-plant performance - II. Simulation of carbon balance and growth at different photon flux densities, 889.

Sims D.A. & Pearcy R.W. Scaling sun and shade photosynthetic acclimation of *Alocasia macrorrhiza* to whole-plant performance - I. Carbon balance and allocation at different daily photon flux densities, 881.

Sinclair T.R. (*see* Purcell L.C.), 837.

Sjöström M. (*see* Ekblad A.), 319.

Sleep D. (*see* Robe W.E.), 1073.

Smart D.R., Chatterton N.J. & Bugbee B. The influence of elevated CO_2 on non-structural carbohydrate distribution and fructan accumulation in wheat canopies, 435.

Smith J.A.C. (*see* Murphy R.), 15.

Smith M. & Wu Y. Photosynthetic characteristics of the shade-adapted C_4 grass *Muhlenbergia sobolifera* (Muhl.) Trin.: control of development of photorespiration by growth temperature, 763

Somerville C. (*see* Gibson S.), 627.

Sonnewald U., Lerchl J., Zrenner R. & Frommer W. Manipulation of sink-source relations in transgenic plants: commissioned review, 649.

Speer M., Brune A. & Kaiser W.M. Replacement of nitrate by ammonium as the nitrogen source increases the salt sensitivity of pea plants. I. Ion concentrations in roots and leaves, 1215.

Speer M. & Kaiser W.M. Replacement of nitrate by ammonium as the nitrogen source increases the salt sensitivity of pea plants. II. Inter- and intracellular solute compartmentation in leaflets, 1223.

Sperry J.S. & Saliendra NZ Intra- and inter-plant variation in xylem cavitation in *Betula occidentalis*, 1233.

Stadler J. (*see* Schulze W.), 795.

Stahlberg R. & Cosgrove D.J. Comparison of electric and growth responses to excision in cucumber and pea seedlings. I. Short-distance effects are a result of wounding, 1143.

Steinlein T. (*see* Heilmeier H.), 1125.

Stevenson D.G. (*see* Downs C.G.), 1045.

Stewart G.R. (*see* Pate J.S.), 1263.

Stitt M. & Schulze D. Does Rubisco control the rate of photosynthesis and plant growth? An exercise in molecular ecophysiology: commissioned review, 465.

Stitt M. (*see* Krapp A.), 861.

Stitt M. (*see* Krapp A.), 945.

Stitt M. (*see* Schulze W.), 795.

Straub P.F. (*see* Kohl D.H.), 1257.

Strid Å. (*see* Jordan B.R.), 45.

Sullivan J.H. & Teramura A.H. The effects of UV-B radiation on loblolly pine. 3. Interaction with CO_2 enhancement, 311.

Sung S.S., Sheih W.J., Geiger D.R. & Black C.C. Growth, sucrose synthase, and invertase activities of developing *Phaseolus vulgaris* L. fruits, 419.

Takabe T. (*see* Kishitani S.), 89.

Takahashi K., Mineuchi K., Nakamura T., Koizumi M. & Kano H. A system for imaging transverse distribution of scattered light and chlorophyll fluorescence in intact rice: technical report, 105.

Talvinen J. (*see* Kangasjärvi J.), 783.

Tardieu F. (*see* Aguirrezabal L.A.N.), 443.

Tengbe M.A. (*see* Koster K.L.), 1285.

Teramura A.H. (*see* Sullivan J.H.), 311.

Theodorou M.E. & Plaxton W.C. Induction of PPi-dependent phosphofructokinase by phosphate starvation in seedlings of *Brassica nigra*, 287.

Thompson G.B. & Drake B.G. Insects and fungi on a C_3 sedge and a C_4 grass exposed to elevated atmospheric CO_2 concentrations in open-top chambers in the field, 1161.

Tjoelker M.G., Volin J.C., Oleksyn J. & Reich P.B. An open-air system for exposing forest-canopy branches to ozone pollution: technical report, 211.

Toh H., Kawamura T. & Izui K. Molecular evolution of phospho*enol*pyruvate carboxylase, 31.

Triantaphylidès C. (*see* Ferullo J.-M.), 901.

Truong H.-N. (*see* Hoff T.), 489.
Turk K.S. (*see* Schünmann P.H.D.), 1315.

Ugalde T.D. (*see* Wang H.L.), 257.
Urbach W. (*see* Brune A.), 153.
Utriainen M. (*see* Kangasjärvi J.), 783.

Valpuesta V. (*see* Perez-Prat E.), 327.
van Arendonk J.J.C.M. & Poorter H. The chemical composition and anatomical structure of leaves of grass species differing in relative growth rate, 963.
Van Kessel C. (*see* Knight J.D.), 173.
Van Laere A.J. (*see* Peeters K.M.U.), 131.
Van Oosten J.-J., Wilkins D. & Besford R.T. Regulation of the expression of photosynthetic nuclear genes by CO_2 is mimicked by regulation by carbohydrates: a mechanism for the acclimation of photosynthesis to high CO_2?, 913.
Vancaeyzeele S. (*see* Garnier E.), 399.
Vanderschmitt E. & Daudet F.-A. The origin and theoretical correction of thermal gradients in thermocouple psychometers: technical report, 97.
Veeranjaneyulu K. (*see* N'Soukpoé-Kossi C.N.), 731.
Volin J.C. (*see* Tjoelker M.G.), 211.

Wall G.W. (*see* Garcia R.L.), 971.
Wand S.J.E. (*see* Musil C.F.), 245.
Wang H.L., Offler C.E., Patrick J.W. & Ugalde T.D. The cellular pathway of photosynthate transfer in the developing wheat grain. I. Delineation of a potential transfer pathway using fluorescent dyes, 257.
Watanabe K. (*see* Kishitani S.), 89.
Wheeler T.R., Morison J.I.L., Ellis R.H. & Hadley P. The effects of CO_2, temperature and their interaction on the growth and yield of carrot (*Daucus carota* L.), 1275.
Whitecross M.I. (*see* He J.), 771.
Whitelam G.C. & Harberd N.P. Action and function of phytochrome family members revealed through the study of mutant and transgenic plants: commissioned review, 615.
Wikström F. A theoretical explanation of the Piper-Steenbjerg effect, 1053.
Wilkins D. (*see* Van Oosten J.-J.), 913.
Witt F.G. (*see* Aparicio P.J.), 1323.
Wolf S. & Lucas W.J. Virus movement proteins and other molecular probes of plasmodesmal function: commissioned review, 573.
Woodall G. (*see* Pate J.S.), 1263.
Woodrow I.E. Control of steady-state photosynthesis in sunflowers growing in enhanced CO_2, 277.
Woodward F.I. (*see* McKee I.F.), 853.
Wu Y. (*see* Smith M.), 763.

Yakir D., Berry J.A., Giles L. & Osmond C.B. Isotopic heterogeneity of water in transpiring leaves: identification of the component that controls the $\delta^{18}O$ of atmospheric O_2 and CO_2, 73.
Yasuda S. (*see* Kishitani S.), 89.

Zhu J.J. (*see* Zimmermann U.), 1169.
Zimmermann U., Meinzer F.C., Benkert R., Zhu J.J., Schneider H., Goldstein G., Kuchenbrod E. & Haase A. Xylem water transport: is the available evidence consistent with the cohesion theory?: opinion, 1169.
Zrenner R. (*see* Sonnewald U.), 649.

Subject index

Abiotic stress, 659.
Abutilon theophrasti, 821.
Acclimation, 955.
Acer saccharum, 731.
Acetyl CoA carboxylase, 123.
Acetylene reduction activity, 319.
Acid:
  growth, 979;
  precipitation, 1009.
Activation energy, 233.
ADP glucose pyrophosphorylase, 341, 601.
ADPGase, 913.
Aerial fertilization effect, 971.
Aesculus hippocastanum, 1331.
After-effect, 845.
Allium cepa L., 163, 1183.
Allocation, 465.
Allometric coefficient, 1243.
Alnus incana, 319.
Alocasia macrorrhiza, 881, 889.
Alpine legume, 115.
Altered gravity, 341.
Aluminium, 989.
Amino acid:
  biosynthesis, 541;
  enzymology, 131;
  transport, 1263.
Amino acids, 1073,1125.
Aminoethoxyvinylglycine, 691.
Ammonia, 131.
Ammonium, 1215.
Anacardiaceae, 1169.
Anacardium excelsum, 1169.
Anaerobiosis, 925.
Andropogon gerardii, 189.
Annual, 399.
Annual sweetclover, 1243, 1249.
Antisense, 557:
  DNA, 465;
  inhibition, 649.
Apoplast, 153, 257, 1223.
Apparent convexity, 701.
Apparent quantum yield, 1205.
Arabidopsis, 627.
Arabidopsis thaliana, 639, 675, 681, 795.
Arctotheca calendula (L.) Levyns, 1113.
Arsenic, 989.
Ascorbic acid, 507.
Asparagus, 1045.
Asparagus officinalis (L.), 1045.
Assimilation, 1073.
Aster tripolium L., 335.
Asteraceae, 245, 1125.
Atmospheric:
  change, 1195;
  CO_2, 935;
  CO_2 enrichment, 971.
Atriplex, 711.
Auxin, 525.
Averaging, 1061.

Barley, 89, 821, 1315:
  leaves, 153.
Bean, 295:
  seed, 419.
Berry, 811.
Beta vulgaris, 457.
Betaine, 89.
Betula occidentalis, 1233.
Betulaceae, 1233.
Bicarbonate, 123.
Biennial species, 1125.
Big bluestem, 189.
Biomass:
  allocation, 311;
  production, 935.
Birch, 1233.
Bisulphite, 731.
Black mustard, 287.
Blackcurrant, 1069.
Blue fluorescence, 777.
Blue grama, 1023.
Blue light, 639.
Blue-light-elicited ΔpH, 1323.
Boundary layer, 1305:
  resistance, 1061.
Bradyrhizobium japonicum, 1257.
Branching enzyme, 601.
Brassica nigra, 287.
Brassica rapa L., 721.
Bush bean, 419.

^{13}C discrimination, 173.
^{14}C-import, 419.
C_3, 1161.
C_3, C_4, C_3-C_4 intermediate species, 143.
C_3 photosynthesis, 747.
C_4, 1161.
C_4 pathway, 31.
Ca^{2+}, 227.
cab, 913.
Cadmium, 989.
Calorimetry, 197.
Canola, 173.
Capeweed, 1113.
Carbohydrate, 771, 861.
Carbohydrates, 1125.
Carbon:
  accumulation, 181;
  allocation, 573;
  concentration, 399;
  dioxide, 123, 311, 345, 853, 971, 1023, 1195;
  nutrition, 443.
Carbonic anhydrase, 123.
Carbon/nitrogen:
  metabolism, 795.
  partitioning, 795.
Carboxylation efficiency, 1205.
Carophyllaceae, 691.
Carotenoids, 557.
Carpinus betulus, 1331.
Carrot, 1275.
Catch crops, 721.
Cavitation, 389.

Cell:
  sap buffer capacity, 681;
  volume, 1295;
  wall, 3, 303, 979.
Cell-to-cell communication, 573.
Cellular pathway, 257.
Cellulose microfibril orientation, 3
Ceratodon purpureus, 669.
Chemical composition, 245, 963.
Chemiluminescence, 457.
Chilling, 205, 739:
  sensitivity, 627.
Chlamydomonas reinhardtii Dangeard, 65.
Chloramphenicol, 55.
Chlorophyll, 935, 1205:
  fluorescence, 55.
Chloroplast, 1223.
Chloroplast, 205, 1223:
  ultrastructure, 55, 771.
Cicumis sativus, 1143.
Circadian rhythms, 755.
Cirsium vulgare, 1125, 1133.
Climate change, 1205.
Climatic change, 1023.
CO_2, 955, 1275:
  assimilation, 935;
  concentration, 747.
Coast redwood, 197.
Coccomyxa sp. Schmidle, 65.
Coffea arabica, 1305.
Cohesion theory, 1169.
Cold, 659:
  pretreatment, 721;
  stress, 89;
  tolerance, 627.
Compartmentation, 1223.
Compensated thermocouple psychrometers, 97.
Construction costs, 881.
Control:
  analysis, 465, 587;
  coefficient, 587.
Cooperative structural relaxation in water, 427.
Copper, 989.
Cortical endoplasmic reticulum, 163.
Cost-benefit, 1133.
Cost/benefit analysis, 889.
Cowpea hypocotyl, 979.
Crassulacean acid metabolism (CAM), 935, 1101:
  pathway, 31.
Crucifereae, 721.
Cucumber, 1143.
Curly grass fern, 1339.
Cytosolic pH measurement, 681.

D1 protein, 55, 205.
Darnel, 755.
Daucus carota L., 1275.
Defence, 783.
Developing grain, 257.
Development, 45, 1315:
  -dependent regulation, 327.
Diaphragm, 355.
Diffusion, 355, 1285.
Dimorphotheca pluvialis, 245.
Diquat resistance, 1113.
Dormancy, 367.
Drought, 659, 845, 1183.
Dryland, 173.
Dunaliella tertiolecta, 227, 1295.
Dysfunctional movement proteins, 573.

EC 3·4.21·36, 81.
Ecotype, 691.
Elasticity, 587.
Electron transport, 451.
Electroporation, 1295.
Elevated CO_2, 189, 435, 1161:
  concentration, 1205.
Elongation, 443, 1315.
Enzyme:
  activity, 783;
  assays, 587.
Epicuticular waxes, 777.
Epidermal cells, 963.
Epidermis, 153.
Erythrosin B, 681.
Ethephon, 691.
Ethylene, 557, 691.
Excessive light, 1153.
Excision, 1143.
Exodermis, 1183.

Fabaceae, 295, 1243, 1249.
Feedback, 853:
  control, 111.
Fern gametophyte, 1339.
Ferricyanide reduction, 457.
Fitness, 821.
Floral initiation, 829.
Flower fragrance, 1069.
Flowering induction, 755.
Fluorescence, 105, 995:
  photobleaching recovery, 1285.
Fluorescent dye, 257.
Flux:
  control, 277;
  measurement, 587.
Frankia, 319.
Freezing tolerance, 89, 1035.
Free-air method, 211.
Fructan, 435.
Fumigation system, 211.
Functional balance, 1195.
Fusicoccin, 681.

Gamma-induced proteins, 901.
Gas exchange, 295.
Gene expression, 45, 557, 783.
Genetic engineering, 659.
Geometrical model, 3.
Global change, 747, 913, 971.
Glomus intraradix, 821.
Glutamine synthetase, 1045, 1331.
Glutathione, 507.
Glycerinated hollow cylinder, 979.
Glycerol, 1295:
  retention, 227.
Glycine max, 97, 267, 1257.
Glycine max [L.] Merr, 341.
Glycolysis, 287.
Grain-filling, 131.
Graminaceae, 963.

Gramineae, 105, 853, 925, 1285, 1315.
Grape, 811.
Grasses, 755.
Green alga, 65, 1323.
Growth, 181, 245, 295, 443, 795, 811, 1009, 1053, 1243, 1275:
  rate, 1143;
  rate coefficient, 419.

Halophyte, 711.
Halophytes, 335.
Heat balance, 867.
Heavy metals, 153.
Hechtian strands, 163.
Helianthus annuus, 73, 277, 443, 701.
Helicoidal texture, 3.
Herbicides, 541.
Heterogeneity, 1061.
Heterogeneous media, 379.
High CO_2, 277.
Higher plants, 541.
High-CO_2 acclimation, 913.
Homeostasis, 989.
Hordeum vulgare L., 65, 89, 829, 1315.
Host-parasite relations, 1263.
HPLC, 1153.
Humidity, 995, 1305:
  measurement, 219.
Hydraulic:
  conductance, 1233;
  signals, 81.
Hypergravity, 341.
Hypogravity, 341.
H^+-ATPase, 1101.

Ice-nucleating substances, 1035.
Imaging, 995.
Immature tissue senescence, 1045.
In situ measurements, 97.
In vitro translation, 925.
In vivo:
  extensibility, 303;
  labelling, 925.
Inorganic carbon affinity, 955.
Intact leaf, 105.
Intercepted PPFD, 443.
Internode elongation, 829.
Invertase, 419.
Ionizing:
  proteins, 901;
  radiation, 901.
Iron deficiency, 1153.
Irradiance, 181.
Irrigation, 173.
Isoenzymes, 861.
Isotopic fractionation, 73.

Kalanchoë daigremontiana, 15.

Lacunar system, 355.
Late Tertiary, 345.
Lathyrus maritimus L., 115.
Leaf, 1315:
  anatomy, 963;
  density, 963;
  morphology, 829;
  nitrogen, 1195;
  protein, 1205;
  unfolding, 377;
  water, 73;
  water potential, 811.
Leaf-atmosphere exchange, 73.
Light, 489:
  acclimation, 881, 889;
  quality, 829;
  scattering, 105.
Light-use efficiency, 955.
Lipid synthesis, 627.
Lipogenesis, 123.
Littorella uniflora, 1073.
Loblolly pine, 311.
Lolium temulentum, 755.
Low temperature, 205.
Lupinus albus L., 845.
Lycopersicon aesculentum, 97.
Lycopersicon esculentum, 557, 901.
Lycopersicon esculentum L., 81.
Lycopersicon esculentum Mill., 181.

Macromolecular trafficking, 573.
Maize, 205, 451, 1285.
Malate, 681:
  dehydrogenase, 457.
Malvaceae, 821.
Mass:
  flow, 355;
  spectrometry, 1073.
Mathematical model, 1195.
Melilotus segetalis, 1249.
Melilotus segetalis (Brot.) Ser., 1243.
Membrane potential, 451, 1143.
Membranes, 627.
Meristem, 675.
Mesembryanthemum crystallinum, 1101.
Mesophyll protoplasts, 153.
Metabolic:
  design, 649;
  regulation, 913.
Metabolism, 541.
Metal tolerance, 989.
Micro-fluorescence imaging system, 105.
Minimum photon requirement, 143.
Model, 747, 1053.
Modelling, 889.
Molecular evolution, 31.
Monocot, 1315.
Monoraphidium braunii, 1323.
Monoterpenes, 1069.
Morphometry, 1009.
mRNA, 1315.
Mucilage, 1035.
Muhlenbergia sobolifera (Muhl.) Trin., 763.
Multivariate data analysis, 319.
Mustard, 173.
Mutants, 489, 525, 541, 615, 639.
Mycorrhiza, 821.

N_2 fixation, 1257.
^{15}N labelling, 1073.
NaCl, 303, 1243, 1249:
  induction, 327.
Needle structure, 1009.
Neighbour detection, 409.

Neogene, 345.
Net photosynthesis, 111.
Nicotiana tabacum, 327.
Nicotiana (transgenic plants), 945.
Nitrate, 1073, 1215:
  absorption, 399;
  reductase, 1263, 1331;
  reduction, 489;
  uptake, 489;
  uptake rate, 721.
Nitrate, nitrite and chloride uptake, 1323.
Nitrite reduction, 489.
Nitrogen, 1073, 1125:
  allocation, 881;
  availability, 1133;
  concentration, 399;
  fixation, 115;
  metabolism, 1045, 1323;
  mobilization, 131, 1331;
  nutrition, 1215, 1223;
  productivity, 399;
  retranslocation, 1133;
  storage, 1133.
Nitrogenase activity, 319.
NMR (nuclear magnetic resonance), 1169:
  relaxation rates, 1035.
Non-structural carbohydrate, 435.
Nutrient productivity, 1053.
Nutrients, 245.
Nutrition, 795.

O_2 transport, 355.
Olax, 1263.
Oleosomes (lipid bodies), 115.
Onion, 163, 1183.
Opportunity costs, 1133.
Opuntia ficus-indica, 935.
Organic acids, 1215.
Organogenesis, 675.
Oryza sativa L., 105, 925.
Oscillation, 995.
Osmolytes, 659.
Osmosis, 427.
Osmotic:
  adjustment, 327;
  potential, 303, 427, 721, 1035;
  pressure, 427, 1169, 1295;
  stress, 739.
Oxidative stress, 507, 901.
Oxidoreductases, 451.
Oxygen-18, 73.
Ozone, 783:
  depletion, 311.

Paraquat resistance, 1113.
Partial least-squares projection to latent structures, 319.
Partitioning, 1195.
Patch, 1061.
Patchiness, 701.
Patchy, 995.
Pea (*Pisum sativum*), 45, 173, 739, 771, 1143, 1215, 1223.
Peach tree, 379.
Pear, 1153.
Perennial, 399.
Petiole investment, 881.
Phaseolis vulgaris, 419.
Phaseolus vulgaris L. cv. Label, 295.
Phenology, 367.
Phenotypic plasticity, 691.
Phloem, 811.
Phosphate starvation, 287.
Phosphoenolpyruvate carboxylase, 123.
Phospho*enol*pyruvate carboxylase, 31.
Phospho*enol*pyruvate phosphatase, 287.
Photoassimilate partitioning, 649.
Photoinhibition, 55, 739.
Photomorphogenesis, 409, 615, 639, 829, 1339.
Photon flux density, 935.
Photoperiodism, 755.
Photoreceptor, 615.
Photorespiration, 763.
Photosynthate transfer, 257.
Photosynthesis, 189, 245, 277, 311, 465, 507, 649, 739, 853, 881, 889, 945, 955, 971, 995, 1023, 1195, 1295.
Photosynthetic:
  acclimation, 1205;
  activity, 731;
  characteristics, 763;
  photon flux density, 111, 935;
  response to PPFD, 701.
Photosystem I, 1113.
Photosystem II, 55.
Phototropism, 1339.
Physcomitrella patens, 669.
Physiological domains, 573.
Phytochrome, 409, 615, 639.
Pigmentation, 295.
Pigments, 45.
PIIF, 81.
Pinaceae, 311.
Pinus eldarica, 971.
Pinus sylvestris L., 389, 1009.
Pinus taeda, 311.
Piper-Steenbjerg, 1053.
Pisum sativum, 45, 173, 739, 771, 1143, 1215, 1223.
Plant:
  distibution, 233;
  evolution, 345;
  water movement, 427;
  water potential, 97;
  water status, 189.
Plants, 783.
Plant/fungi interactions, 1161.
Plant/insect interactions, 1161.
Plasma membrane, 163, 227, 451, 1285:
  H^+-ATPase, 327.
Plasmalemma, 451:
  H^+ pump, 681;
  surface area, 1183.
Plasmodesmata, 573.
Plasmolysis, 163.
PLS, 319.
Poaceae, 131, 189, 399, 451.
Polyamine, 227.
Polyblepharidaceae, 1295.
PPi-dependent phosphofructokinase, 287.
Prairie, 1023.
Pressure chamber, 15, 1169.
Pressure probe, 15.
Proline dehydrogenation, 1257.
Protein, 1295:
  synthesis, 45, 205.

Proteinase inhibitors, 81.
Protoplasts, 739.
Prunus persica (L. Batsch), 379.
psa A-*psa* B, 913.
psb A, 913.
Psychrometer, 219.
Pyrus communis, 1153

Quercus petraea, 1331.
Quiescence, 367.

Rain daisy, 245.
Red light, 143.
Red/far-red ratio, 409.
Regulation, 489.
Relative growth rate, 399, 963, 1133.
Reproduction, 245, 795.
Resistance, 355.
Respiration, 197, 233, 739, 853, 955, 1295.
Rest, 367.
RFLPs, 557.
Ribes nigrum, 1069.
Ribesiaceae, 1069.
Ribulose-1,5-bisphosphate carboxylase-oxygenase, 945, 1205.
Rice, 105, 925.
Ripening inhibitor, 557.
RNA transcripts, 45.
Root, 443:
  hemiparasite, 1263;
  nodule, 31;
  nodules, 115;
  system, 443;
  tip growth, 303;
  water potential, 379;
  xylem exudation, 721.
Root-to-shoot:
  communications, 845;
  ratios, 573, 1195, 1275.
Rubisco, 465, 1205:
  activase, 913.
Rythmicity, 1069.

Salinity, 335, 1223, 1243, 1249.
Salt, 659:
  stress, 335, 1101;
  tolerance, 327, 711, 1215.
Sambucus nigra, 1331.
Sap flow, 867.
Schizaea pusilla, 1339.
Schizeaceae, 1339.
Sclerenchymatic cells, 963.
Seasonal variability, 821.
Seasonal variation, 1331.
Seed quality, 821.
Seeds, 795.
Senescence, 131, 1331.
Sensitivity analysis, 277.
Separation, 1073.
Sequoia sempervirens, 197.
Short-grass steppe, 1023.
Signal transduction, 525.
Silver thiosulphate, 691.
Sink:
  metabolism, 419;
  strength, 419, 913.
Sink-source, 649.
Slender, 1315.
Sodium:
  accumulation, 711;
  ions, 335.
Solanaceae, 901.
Solanum tuberosum, 601.
Soluble protein, 1073.
Source-sink relations, 443.
Soybean, 267, 1257.
Specific absorption rate, 1249.
Specific utilization rate, 1249.
Spectral distribution, 111.
Spinacia oleracea, 55.
Split root, 379.
Sr^{2+}, 227.
Stable isotopes, 73.
Starch, 853:
  quality (structure), 601;
  quantity, 601;
  synthase, 601.
Starch/nitrate mutants, 795.
Stellaria longipes, 691.
Stem:
  elongation, 691;
  hygrometer, 97.
Stimulus-response, 675.
Stomata, 335, 701, 995, 1305.
Stomatal:
  conductance, 189, 845;
  regulation, 345;
  resistance, 1061.
Storage, 1073, 1125.
Stratospheric ozone reduction, 267.
Streptomycin, 55.
Stress tolerance, 659.
Subarctic pine forest, 1009.
Suberin lamella, 1183.
Submerged macrophytes, 955.
Submersed vascular plant, 355.
Substrate measurement, 587.
Sucrose, 853:
  metabolism, 419;
  synthase, 419.
Sugar maple (*Acer saccharum*), 211.
Sulphite, 731.
Sunflower, 277, 443, 701.
Supercooling, 1035.
Superoxide dismutase, 507.
Supplementary UV-B radiation, 771.
Surface potential, 1143.
Symbiotic diazotropy, 123.
Symplast, 257.
Systemic defence responses, 81.

Tap-root, 1133.
Temperature, 181, 747, 1069, 1275.
  coefficient, 233;
  sensitivity, 451;
  stress, 1285.
Theoretical correction, 97.
Thermal gradients, 97.
Thermogenesis, 123.
Thigmomorphogenesis, 691.
Thistle, 1125, 1133.
Time series analysis, 319.
Tobacco, 327, 409:

mosaic virus, 573.
Tomato (*Lycopersicum esculentum*), 557, 913:
fruit, 181, 901.
Tonoplast, 1101.
Trade-offs, 1133.
Transformation, 669.
Transgenic:
plants, 409, 489, 525, 541, 601, 615, 649;
tobacco, 573.
Transpiration, 73, 811, 867, 1023, 1305.
Transport, 489:
mutants, 681.
Tree growth, 971.
Triticum aestivum L., 131, 435, 853, 1205.
Tropical alpine, 1035.
Turgor pressure, 15.

Ultrafiltration, 1073.
Ultraviolet-B radiation, 245.
Umbelliferae, 1275.
Uptake, 1053.
UV0B/PAR ratio, 295.
UV-A, 267:
light, 639.
UV-B, 45, 267:
radiation, 311.

Vacuole, 153.
Valerianella locusta, 55.
Vascular water flow, 811.
Vigna unguiculata, 979.
Viral:
movement proteins, 573;
resistance, 573.
Vitaceae, 811.
Vitis vinifera, 811.
Volatiles, 1069.

Water:
potential, 15, 181;
relations, 1233;
stress, 777, 1233, 1257;
uptake, 379;
use, 867.
Water-use efficiency, 173.
Weather conditions, 319.
Western wheatgrass, 1023.
Wet and dry bulb, 219.
Wheat, 131, 173, 435.
Wheat (*Triticum turgidum*), 257.
Whole-plant carbon gain, 881.
Wind, 1305:
stress, 691.
Wounding, 81, 1143.

Xanthophyll cycle, 1153.
Xylem, 389, 811:
ABA, 845;
cavitation, 1233;
nitrate flow, 721.
pressure, 1143, 1169;
pressure probe, 1169;
sap, 15, 1263;
structure, 1233.

Yellow flesh, 557.
Yield threshold, 303, 979.

Zea mays L., 205, 303, 451, 1285.
Zinc (compartmentation), 153.
Z-scheme, 143.